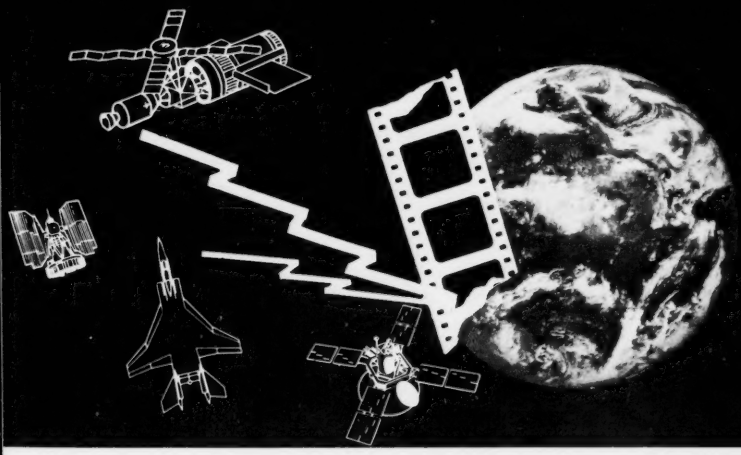
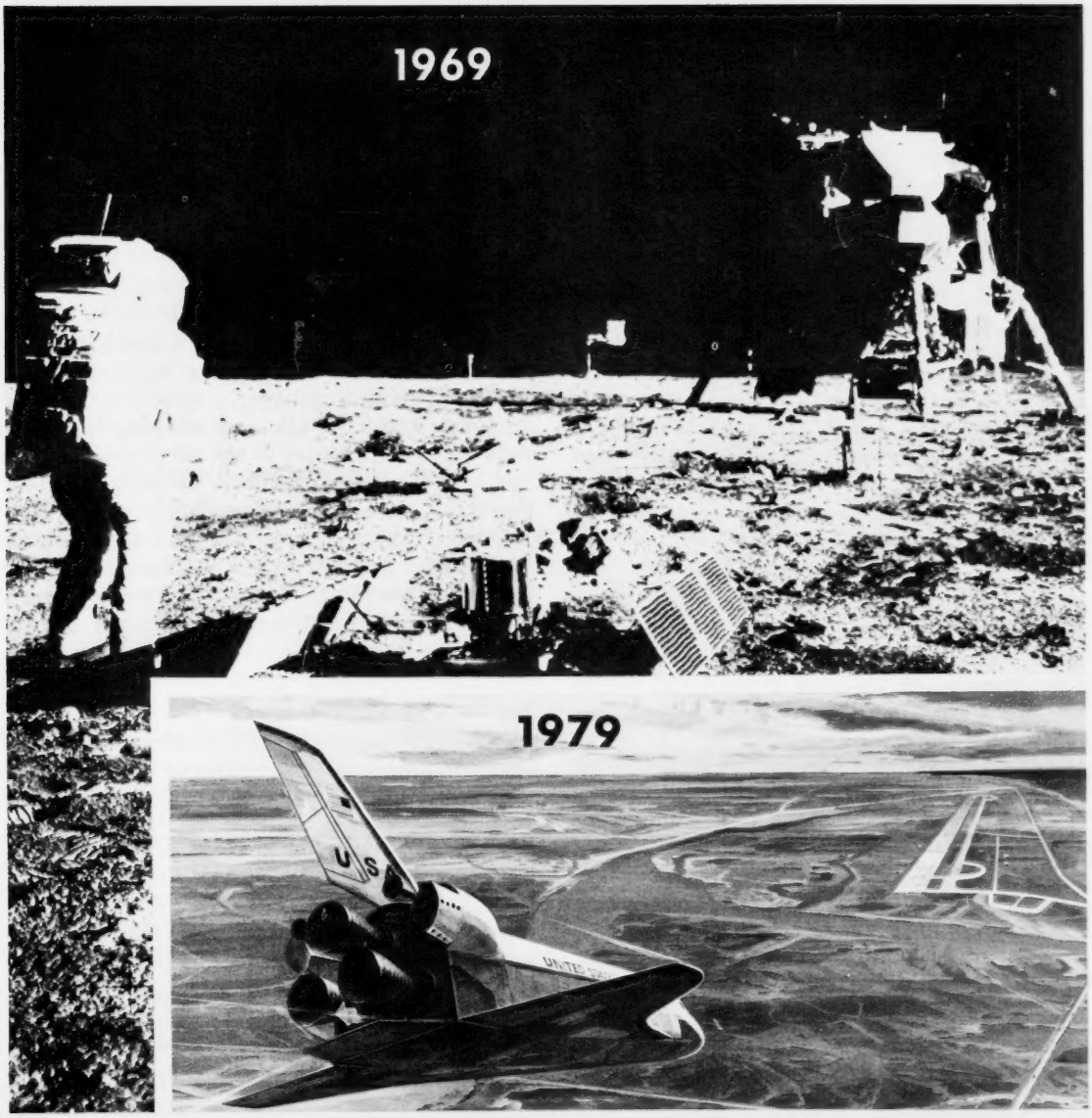


NASA ACTIVITIES

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

July 15, 1974 Vol. 5, No. 7



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AIR & SPACE MUSEUM ALREADY A POPULAR SPOT FOR TOURISTS

Attraction Is in Stride with Landing Anniversary as New Building Takes Shape

At present, about one out of every 70 Americans visits the Smithsonian Institution in Washington annually to view the exhibits in the National Air and Space Museum. In 1976, the Bicentennial Year, the ratio is expected to change to one out of 30.

These are current attendance figures at the Museum as it prepares to mark the fifth anniversary of the first landing on the Moon. Three million visitors are recorded there annually—about 1,000,000 at the Air and Space Building, referred to as the "tin shed," and 2,000,000 at the Arts and Industries Building, which since 1967 has been temporary quarters for a part of the exhibits.

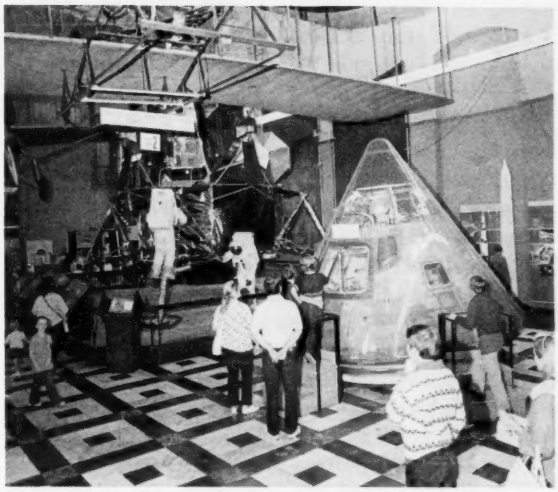
But the Museum Director, Michael Collins, former astronaut who piloted the command module on the Apollo 11 flight during the initial Moon landing, estimates that the opening of the new National Air and Space Museum on July 4, 1976, will send attendance soaring to 7,000,000 per year.

With the new Space Museum under construction only a short distance away rapidly taking on its final outward appearance (See NASA activities, Vol. 5, No. 1), plans are shaping toward the date when the transfer to the permanent quarters can be made. Next February, workmen will begin emptying the Air and Space Building, which will be torn down, and start moving the exhibits out of the Arts and Industries Building. From then until the formal opening of the new building in 1976, there will be virtually no space museum open to the public.

But the main interest now is in properly observing the fifth anniversary of the Moon landing. In his forthcoming book, "CARRYING THE FIRE," Director Collins says he looks back on the flight with a mixture of "smugness, pride, and incredul-

COVER

Five years ago, the Apollo 11 Lunar Module, Eagle, landed on the Moon; in about five years, the first Space Shuttle will land at KSC after orbiting the Earth.



LUCKY MUSEUM VISITORS—In the photo on the left, Michael Collins, Director of the National Air and Space Museum, explains to Aubrey Hendrick of Washington, DC, and David R. Williams, Jr., of Longview, TX, the workings of the command module that he flew on the Apollo 11 Moon landing. At right is the view just inside the entrance to the museum, showing the Wright brothers' original plane, the command module and a lunar module.

ity." He adds that he now remembers two moons, one the backyard variety, familiar to all, and the other the tortured, scarred carcass he saw close up. He cannot focus on the latter without his mind transferring instantly to the verdant Earth, and to the startling contrast its diversity offers. "You can't fully appreciate the first planet without having visited the second one," he says.

Museum Slow Developing

The idea of a permanent aviation museum had been discussed for many years, but it did not reach fruition until 1946. Congress passed a law that year establishing a National Air Museum "to memoralize the national development of aviation; collect, preserve, and display aeronautical equipment of historic interest and significance; serve as a repository for scientific equipment and data pertaining to the development of aviation; and provide educational material for the historical study of aviation."

But it was years before steps to construct a suitable building actually got underway. In the meantime, the law was amended in 1966 to change the name to the National Air and Space Museum. The Vietnam war caused still further delay, and finally, in 1972, $13 million was appropriated and construction began.

Exhibits already on hand and awaiting completion of the building will tell the story of man's efforts to fly, ranging all the way from his faltering ascents in hydrogen and hot-air balloons, the surge of powered flight following the Wright brothers' achievement at Kitty Hawk in 1903, to the spacecraft of today.

Writing in AEROSPACE, the official publication of the Aerospace Industries Association, Collins recently stated:

"From Kitty Hawk to the Moon, the pace has been increasingly swift, the technology more and more sophisticated, the story ever more complex. No important segment of it can be slighted, not the contributions of a Goddard or a Lindbergh, not the story of the aerospace industries and what they contribute to the quality of our lives.

"In addition, I believe that a museum of this type should not only examine the past but explore future possibilities. I believe that it should not only display artifacts, but act as a catalyst in exchanging information, and to grow into a true national center for aerospace historical research."

Even now, visitors to Smithsonian are able to see exhibits that are genuine. Suspended inside the entrance of the Arts and Industries Building is the Wright brothers' "Kitty Hawk Flyer," the world's first manned and controlled powered airplane. Behind it hangs Charles A. Lindbergh's "Spirit of St. Louis." And nearby, presenting a dramatic contrast, are the Apollo 11 command module, "Columbia," and, a few feet away, a lunar module similar to that which first landed on the Moon.

MONTHLY NASA HIGHLIGHTS

PRESIDENT SIGNS NASA AUTHORIZATION BILL

Public Law 93-316, authorizing $3,266,929,000 for NASA during Fiscal Year 1975 and signed by the president on June 22, represents an $18,000,000 increase over the NASA Budget Request. The Research and Development portion of the authorization amounts to $2,372,815,000, a $26,800,000 increase over the $2,346,015,000 included in the Budget Request for this item. While the Space Shuttle authorization was increased by $5,000,000, space flight operations was decreased by $10,000,000. Consequently, the total Manned Space Flight authorization was reduced by $5,000,000. An additional $3,000,000 was authorized for launch vehicle procurement. However, the largest increase was designated for the Applications Program, which received an additional $18,800,000.

HOUSE PASSES NASA APPROPRIATION BILL

The Fiscal Year 1975 NASA Appropriations Bill, passed by the House on June 26, provides $3,203,050,000, a drop of $44,079,000 below the NASA Budget Request. The House has reduced the amount contained in the Budget Request for Research and Development by $18,635,000; Construction of Facilities by $15,820,000; and Research and Program Management by $9,624,000. The Senate version of the bill still is being considered by the Senate Appropriations Subcommittee.

FIFTH ANNIVERSARY OF THE FIRST LUNAR LANDING

The fifth anniversary of the first Apollo lunar landing will be observed on July 20. The practical application of technology developed by the Apollo Program to almost every field of human activity has greatly compensated for the nation's investment in manned space flight.

ASTP ACTIVITIES

U.S. Apollo-Soyuz Test Project specialists were in the Soviet Union during the month of June for testing of VHF/AF flight communications hardware (June 1-28) and for photo and TV testing in the Soyuz mockup (June 17-28). The joint-flight crew began a 3-week training session on June 24 at Star City, the cosmonaut training center near Moscow. Soviet specialists arrived at Johnson Space Center on July 1 for extended compatability tests of the docking system.

ESRO/SPACELAB CONTRACT AWARD

On June 6, the European Space Research Organization awarded a prime contract worth approximately $226,000,000 to VFW Fokker/ERNO of Germany for design and development of Spacelab, the manned orbital laboratory which nine European countries are building to operate with the U.S. Space Shuttle system.

SATELLITE ADVANCES WEATHER DATA RETURN

The first day and night pictures of developing weather patterns were transmitted from synchronous orbit by SMS-1, the NASA meteorological satellite launched May 17 from Cape Canaveral. Excellent pictures of the Western Hemisphere have been returned every 30 minutes since its stabilization in orbit over the Equator. The satellite has been returning cloud cover photographs and transmitting other data in support of an international investigation of weather in Earth's tropical belt, called the GARP (Global Atmospheric Research Program) Atlantic Tropical Experiment (GATE), since June 15. In September, it will become part of an operational NOAA system, providing continuous observation of the U.S. and adjacent ocean areas. Earlier advanced weather spacecraft were restricted by their inclined orbits from providing the continuous, uninterrupted transmission of which SMS-1 is capable.

BOEING 747 TO FERRY SPACE SHUTTLE ORBITER

A used Boeing 747 type aircraft purchased from American Airlines for approximately $16,000,000 will transport the Space Shuttle Orbiter and related shuttle hardware across country, and will be used to air launch the Orbiter for approach and landing tests. Original plans called for installation of six airbreathing engines on the delta-winged Orbiter for flight testing and for ferry flights between the West

Coast and the Kennedy Space Center launch site. With the 747 aircraft, it will also be possible to ferry the 153-foot-long external tank in piggyback fashion. The aircraft will be modified and equipped with permanent fittings permitting quick installation of either the Orbiter or the external tank.

MISSISSIPPI TEST FACILITY RENAMED

The National Space Technology Laboratories (NSTL), formerly known as the Mississippi Test Facility, in Bay St. Louis, MS, became a permanent NASA field installation on June 14, reporting directly to NASA Headquarters. The facility's new status was related to the growing importance of its activities to current and future NASA programs and to fuller utilization of its unique expertise in remote sensing, environmental, and related research and technical projects by other governmental agencies.

FLYING LABORATORY RESEARCHES NATIONAL AIRSPACE SYSTEMS PROBLEMS

Aided by an extensively modified Boeing 737 "flying laboratory," Langley Research Center has commenced research activity supporting the NASA Technical Configured Vehicle (TCV) Program. In seeking a solution to acute national airspace systems problems, such as aircraft noise, airway and airport congestion and safety during low visibility operations, Langley will pursue technology for air operations using DOT and FAA-developed ground equipment and air traffic control procedures.

HAWKEYE LAUNCHED

Explorer 52 (Hawkeye 1) was launched successfully by the first five-stage Scout vehicle on June 3 from the Western Test Range and is performing excellently. All housekeeping functions are nominal; all transmitters and experiments are operating satisfactorily. The spacecraft will investigate the physical phenomena that result from the interactions of the solar wind with the geomagnetic field with emphasis on the North Polar Cap.

NASA BEGINS LONG-RANGE PLANNING EXERCISE

On June 7, a planning team was formed to develop by June, 1975, a long-range plan for U.S. civilian space activities for the period 1979 to the year 2000 and beyond. The team is headed by Don Hearth, Deputy Director of GSFC, and is to be made up of approximately 20 of NASA's most imaginative and innovative employees. They will seek ideas and suggestions from NASA Centers and Program Offices, consultants respected for their imagination and farsightedness, other government agencies, universities, and industry. Among the topics to be considered will be management of Earth's resources and environment; space processing; planetary exploration after the Viking Mars mission; search for intelligent extraterrestrial life; lunar bases and space stations; future of astronomy and astrophysics; communications; use of space for energy supply to Earth; development of commercial interest in space; interplanetary manned travel; interstellar travel; and space colonization.

ALADDIN'S LAMP LIGHTS THE SKY

On June 30, NASA and the Air Force Cambridge Research Laboratories cooperated in the launch of 54 sounding rockets from the Wallops Flight Center. Several foreign countries also participated in the project. To satisfy the scientific objectives, the rockets were launched within a 24-hour period. The ALLADIN Project, as the program was called, was designed to study the atmospheric layering and density distribution of ions and neutrals. Ten of the rockets launched involved the release of chemicals which formed bright yellow-green and pinkish clouds visible to the naked eye over most of the eastern seaboard. Visual observations were made in concert with observations from the Atmospheric Explorer C Satellite, the NASA Ames Research Center Lear Jet, and ground instruments.

DELTA REVIEW DELAYS WESTAR-B LAUNCH

A Review Committee headed by Lt. Gen. Charles H. Terhune, Jr., USAF (Ret.), Deputy Director of the Jet Propulsion Laboratory, has been appointed to review all anomalies in the Delta rocket launch's recent history, including those related to the May 17 launch of SMS-1, and report their findings by July 18. In the meantime, the launch of Westar-B, the second in the series of Western Union domestic communications satellites, has been postponed.

ATS-6 STATUS

ATS-6, the last and most sophisticated of the Applications Technology Satellites series, which was launched May 30, is now in the final phases of its operational checkout. The spacecraft with its 30-foot diameter antenna structure and associated communications system is capable of providing a good quality TV signal to small, inexpensive ground receivers, and to measure and evaluate the performance of such a system. The spacecraft was scheduled to be turned over during late June to the experimenters for a series of pre-operational checks of the spacecraft and experiment ground interfaces. Results of the systems and experiment checkout completed during early June have surpassed expectations. All systems are operating nominally and no significant problems have been reported.

Shortly after the spacecraft becomes operational, NASA and the Department of Health, Education and Welfare will work together conducting Health-Education-Telecommunications experiments, which encompass both educational TV and two-way medical teleconferencing demonstrations. In approximately one year, the satellite will be moved to a different location where it can be used by the Indian Government to broadcast daily TV programs to 5,000 villages and cities in seven states throughout India.

WASHINGTON CATHEDRAL WINDOW TO RECALL FIRST MOON LANDING

Contributed by Former NASA Administrator Paine, It Will Feature 7.18-gram Lunar Rock

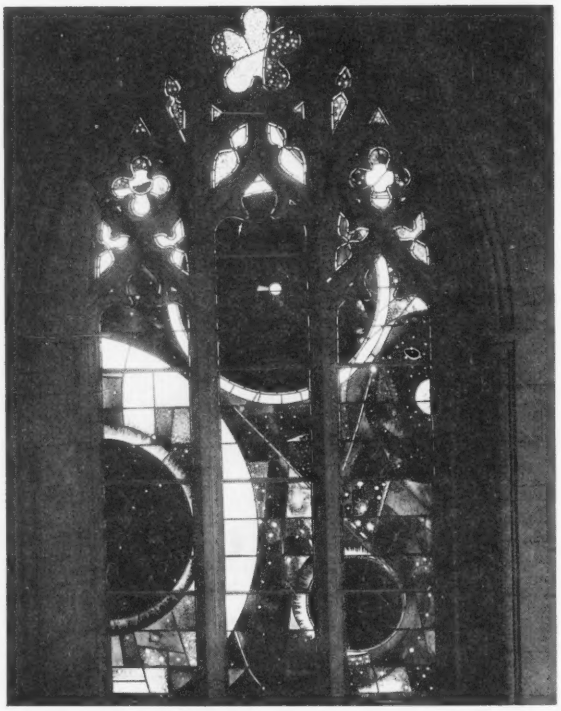
A Space Window depicting swirling stars and orbiting planets and centered around a rock brought back from the first mission to the Moon will be dedicated in special services of commemoration and thanksgiving at the Washington Cathedral, a national landmark visited annually by hundreds of thousands of tourists, at 11 a.m. Sunday, July 21.

The service will be open to the regular congregation and to the general public. All people interested in the space community are especially invited. The Dean of the Cathedral has extended a special invitation to all NASA employees.

Marking the fifth anniversary of the lunar landing, Dean Francis Sayre of the Cathedral will deliver a sermon on the spiritual significance and the religious implications and values and the impact on mankind of the first journey to the Moon from the planet Earth.

The window, in stained glass, depicts an abstractive vision of man in outer space. It was contributed by Dr. Thomas O. Paine, Administrator of NASA at the time of the landing and now a Vice President of the General Electric Co. During the service, he will read one of the Lessons. Another will be read by Dr. James C. Fletcher, present Administrator.

President Nixon and the crew of Apollo 11—Neil A. Armstrong, Michael Collins and Edwin E. Aldrin, Jr.—have been invited to attend. One of them will make a special presentation of the lu-



CATHEDRAL GETS SPACE WINDOW—The little white spot in the center of this 19-foot stained glass window in the Washington Cathedral marks the spot where a lunar rock brought back by the Apollo 11 crew will be inserted at a later date.

nar rock to Dean Sayre at the service.

The rock, identified as specific piece No. 230 of Apollo 11 rock No. 10057, weighs 7.18 grams and was returned from the Sea of Tranquility. It is believed to have crystallized approximately 3.6 billion years ago. In it was found the mineral pyroxferroite, so far unknown on Earth.

A white glass circle in the center of the window and 33 feet above the floor of the Cathedral will be removed when the rock is imbedded. The rock section is sealed between two pieces of tempered glass circled with a band of stainless steel. The sealing was done in a nitrogen environment so that any void space between the two pieces of glass will be filled with nitrogen rather than air. This will prevent moisture and oxygen from contacting the sample and possibly degrading it.

HINNERS SUCCEEDS NAUGLE

Dr. Noel W. Hinners, Director of Lunar Programs in the Office of Space Science, has been appointed Associate Administrator for Space Science, succeeding Dr. John E. Naugle, who has assumed the position of Deputy Associate Administrator.

In 1972, Dr. Hinners joined NASA as Deputy Director and Chief Scientist for Apollo Lunar Exploration in the Office of Manned Space Flight. When the Apollo program was completed, he moved to the Office of Space Science.

Dr. Noel W. Hinners

Before joining NASA, he had worked at Bellcom, Inc., as a member of the technical staff, supervisor of the lunar science group and head of the lunar science exploration department. In 1971, while at Bellcom, he was awarded the NASA Exceptional Scientific Achievement Medal.

Chairman of NASA's Lunar Dust Erosion Study Committee in 1969-70 and the Apollo Photo Data Users Group in 1971, he was also Chairman of the Apollo Site Committees for the Apollo 12-17 missions.

Born in Brooklyn, NY, in 1935, Dr. Hinners received his Bachelor of Science degree from Rutgers University, Master of Science degree from the California Institute of Technology, and his doctorate in geology from Princeton University.

FORD SAYS U.S. FRONTIER HAS MOVED TO OUTER SPACE

Vice President Praises Technology at Collier Dinner Honoring Skylab Astronauts

The excellence of American astronauts was cited as one of the most impressive phases of the space program by Vice President Gerald R. Ford, principal speaker at the dinner in Washington in early June at which the Robert J. Collier Trophy was presented the Skylab organization by the National Aeronautics Association.

The trophy was accepted by William C. Schneider, Director of the Skylab Program, on the part of all those honored.

Especially-designed commemorative plaques also were presented the astronauts making up the three Skylab crews. They are Charles Conrad, Jr., Joseph P. Kerwin and Paul J. Weitz, first mission; Alan L. Bean, Owen K. Garriott and Jack R. Lousma, second mission; and Gerald P. Carr, Edward G. Gibson and William R. Pogue, third mission.

The Vice President's remarks follow:

"Mr. Chairman, distinguished guests, ladies and gentlemen, I am grateful to you for the opportunity to be here this evening to participate in making this distinguished award.

"Of all the creatures of the Earth, there has been none that man envies as much as the bird. From the beginning of time, men have longed to fly.

"The falcon, the hawk, and the eagle have found their way into art and literature as expressions of universal yearning to escape from an earth-bound existence. Their qualities of grace, beauty, stamina and speed have been translated into national symbols to personify man's outreach, his goals, and the search for new horizons.

Age of Flight

"Despite all of the other 20th Century achievements of technology, radio, the automobile and television, our era will probably be known best as the Age of Flight. For our generation this age-old desire was fulfilled—man was no longer prisoner of the Earth. Like the sea, the sky has also become man's environment. He has unlocked the secret of flight.

"In just two and a half decades after the

Wright Brothers' plane lifted off the sands of Kitty Hawk, the 'Spirit of St. Louis' crossed the Atlantic, and the world had a new hero in a young man named Charles A. Lindbergh. In just over 40 years after Lindbergh, 'The Lone Eagle,' touched down at Le Bourget Field near Paris, the world would hear transmitted from the surface of the Moon the words in purest American accents—'The Eagle has landed.' Man has truly begun his trek into space.

"From the sand dunes of Kitty Hawk to the craters of the lunar surface is a story of one of man's greatest adventures that draws its inspiration from the pioneer spirit of the American people.

"Since the early days of Kitty Hawk, the United States has led in aviation. Aircraft design and engine development are just part of the saga of American aviation history.

"These advances have enabled us to have as firsts many of the epoch pioneer flights that are indelibly written in the pages of history. The daring, the skill, and the courage of those men who made these flights are as much a part of the American folklore as the explorers and scouts who charted the trails across the American West.

"Today, the frail biplane of the Wrights seems a primitive relic from a bygone era. However, I suggest to future generations in the year 2000 the present Skylab space vehicle will not only appear antiquated, but will evoke amazement that men really ever lived in space in such a primitive craft.

Three Things in Common

"On its first flight in December of 1903, the Wrights' simple biplane, with a 12-horsepower motor they built themselves, managed to fly 120 feet in 12 seconds. Basically it had much in common with the complex spacecraft we know today which fly 500,000 miles at speeds up to 17,000 miles per hour. I would mention three. Each is an achievement of science, technology, and human skill. It is this achievement that we honor here tonight.

"We honor the engineering and modern design that brings together the technology developed through science and, more particularly, through Research and Development.

"When we look at the development of technology and application of science, we see the tremendous investment of human resources. Tens of thousands of people contribute to this phase of aviation. Without this talent bank we could not have a Skylab. Without this management we could not undertake our complex flights into space. We honor this team effort through the presentation of the Collier Trophy, not only to the three Skylab crews, but to the 26,000 men and women whose mutual efforts gave us this great success.

"I mention to you the combination of science, technology, and skill. These factors, together with our great resources of people, account for American preeminence in aviation and flight into space. This preeminence has been achieved through advances in the state-of-the-art through technological achievement which combines scientific research, engineering, and design. This same technology takes a miniaturized circuit from a spacecraft and adapts it to a home appliance, a heart pacemaker, and even into mass transit systems.

"Research and Development is the process whereby we bring on a stream of new and improved technology. It is a field in which America has excelled, and because we have excelled we have become preeminent.

"The 21st Century will be shaped and influenced by those who continue to advance the state-of-the-art. It will be shaped by those who excel in developing human resources and by those who excel in the development of technology.

Human Skills Emphasized

"However, the history of aviation has placed an unprecedented emphasis on human skills. The failure of design or of engineering can exact a terrible price.

"One of the most impressive parts of our space program which I feel inspired Americans of all ages was the excellence of those selected to be our astronauts. Their combination of physical skill, knowledge of flight, and courage made us all aware of human potential.

"The future has always been the frontier of aviation. It is an ever-expanding frontier.

"This future encompasses both commercial aviation and flights into space.

"Since the days of Kitty Hawk and Lindbergh's solo crossing of the Atlantic, commercial airlines criss-cross our nation and expand into the far corners of the globe. The capitals of other continents are closer in time than the major cities of our own country a hundred years ago.

"We have begun to probe the reaches of space where distances are measured in light years rather

than in miles. However, I do not believe that vast unknown is any more terrifying than were the vast reaches of an unsailed Atlantic 500 years ago.

"Our frontier today is in outer space. The mystery of our undiscovered continent in the 16th Century gives way to the mystery of unexplored planets in the 20th.

"Today we have the opportunity to be the pathfinders to the galaxies and constellations on which man has hitherto only gazed and guessed.

"We have begun to move towards this new horizon through the efforts of those we honor tonight. We are embarked on a challenge to excel, and in this challenge, through their efforts, I am confident we shall succeed.

"We shall succeed because, in the words of John Steinbeck in the GRAPES OF WRATH, 'Unlike any other thing in the Universe, man grows beyond his dreams, walks up the stairs of his concepts, and emerges ahead of his accomplishments.' "

KING HEADS OFFICE

Dr. James King, Jr., Manager of the Physics Section at the Jet Propulsion Laboratory, has been named Director of the Environmental Effects Office of NASA's Space Shuttle Program.

In his new post, which he assumed June 24, he will guide programs for stratospheric research and for assessing the effect of Shuttle flights on the Earth's atmosphere. He is recognized as one of the nation's outstanding space and atmospheric physicists.

Dr. James King

Dr. King, 41, also has been a consultant to the Los Angeles Air Pollution Control District and served on its scientific committee for four years.

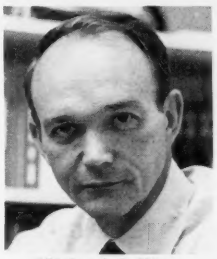
With JPL since 1961, he administered a section with 65 employees and a $3 million budget. His research work there on the reaction of gas molecules led to an internationally-recognized theory of anesthesiology.

He holds a M.S. degree in chemistry and a Ph.D. in chemistry and physics from the California Institute of Technology. Before joining JPL, he was a teaching assistant at Caltech and also worked for Electro-Optical Systems in Pasadena.

COLLINS WRITES BOOK

Michael Collins, the astronaut who steered the Apollo 11 command module around the Moon while Astronauts Neil A. Armstrong and Edwin E. (Buzz) Aldrin, Jr., went down in the lunar module to make the initial landing on the Moon, will observe the fifth anniversary of that momentous event by becoming the first astronaut to write a book all on his own.

The volume, entitled "CARRYING THE FIRE," will be published by Farrar, Straus & Giroux of New York City July 20, the anniversary of the landing.



Michael Collins

The foreword for the book was written by Charles A. Lindbergh. In it he states:

"Perception, clear and comprehensive, targeted on life's first expedition to the Moon's surface, this book combines a contemplative mind and poet's eye with the essentially practical approach of a participating astronaut."

INVESTIGATORS SELECTED

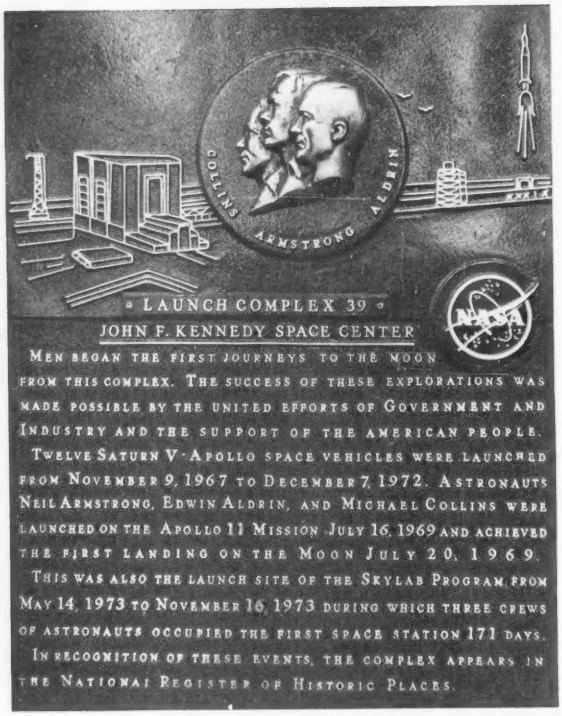
Thirty-nine scientists have been chosen by NASA to provide the experiments for two Pioneer spacecraft destined for Venus in 1978.

The teams, including one scientist each from France and Germany, were selected from among 162 scientists who submitted proposals in response to a NASA invitation last year.

Primary objective of the twin missions is to study Venus and its environment. A detailed investigation of that planet's atmosphere and clouds will be conducted, and from this could come information leading to a better understanding of the Earth's atmosphere.

The Pioneer Venus project is managed by Ames Research Center.

A contract has been awarded the Quinn Company of Huntsville, Inc., for work on Building 4487 at Marshall Space Flight Center. Involved is the installation of a larger chiller and modification of the air conditioning system. Work also will be done to provide for the installation of computers and other electronic equipment.


COLLINS
ARMSTRONG
ALDRIN
• LAUNCH COMPLEX 39 •
JOHN F. KENNEDY SPACE CENTER
MEN BEGAN THE FIRST JOURNEYS TO THE MOON FROM THIS COMPLEX. THE SUCCESS OF THESE EXPLORATIONS WAS MADE POSSIBLE BY THE UNITED EFFORTS OF GOVERNMENT AND INDUSTRY AND THE SUPPORT OF THE AMERICAN PEOPLE.
TWELVE SATURN V-APOLLO SPACE VEHICLES WERE LAUNCHED FROM NOVEMBER 9, 1967 TO DECEMBER 7, 1972. ASTRONAUTS NEIL ARMSTRONG, EDWIN ALDRIN, AND MICHAEL COLLINS WERE LAUNCHED ON THE APOLLO 11 MISSION JULY 16, 1969 AND ACHIEVED THE FIRST LANDING ON THE MOON JULY 20, 1969.
THIS WAS ALSO THE LAUNCH SITE OF THE SKYLAB PROGRAM FROM MAY 14, 1973 TO NOVEMBER 16, 1973 DURING WHICH THREE CREWS OF ASTRONAUTS OCCUPIED THE FIRST SPACE STATION 171 DAYS.
IN RECOGNITION OF THESE EVENTS, THE COMPLEX APPEARS IN THE NATIONAL REGISTER OF HISTORIC PLACES.

MARKING A HISTORIC PLACE—As part of the observance of the fifth anniversary of the launching of Apollo 11, this 27-by-22-inch plaque will be unveiled by members of its crew at a temporary site at Launch Complex 39, scene of the Apollo and Skylab launchings, at Kennedy Space Center July 16. Later, it will be moved to a permanent site, not yet announced.

KOHOUTEK WORKSHOP

Astronomers and scientists from the U.S. and abroad gathered at Marshall Space Flight Center June 13-14 to take part in a Comet Kohoutek Workshop.

BOND DRIVE UP NEARLY 3.5%

The 1974 NASA Savings Bond Campaign resulted in an agency-wide participation rate of 77.7 per cent, with 866 new buyers, five installations compiling records of more than 80 per cent, and one of them achieving 100 per cent.

"This is an excellent showing and represents an increase of nearly 3.5 per cent over the percentage at the beginning of the campaign," H. Frank Hann, Vice-Chairman of the drive, reported.

In addition to the new subscribers, 940 of those already subscribing increased their payroll allotments. The new and increased deductions will result in additional savings of more than $729,000 a year, for a total yearly saving of over $15,000,000.

The Jet Propulsion Laboratory achieved 100 per cent participation and will receive the Treasury Annual Citation. The Kennedy Space Center, Langley Research Center and Wallops Flight Center had rates of better than 90 per cent and Johnson Space Center better than 80 per cent, each earning a Minuteman Flag. Employees at KSC, for the sixth consecutive year, participated at a level of 90 per cent or higher.

1974 SAVINGS BONDS CAMPAIGN RESULTS

Installation	*No. of Personnel*	*New Buyers*	*Total Bond Buyers*	*Percent Participation*	*No. of Bond Increases*	*Percent Increase in Part.*	*Percent of Buyers Increasing*	*Total Add'l Deductions per Pay Period*
NaPO	40	5	40	100.0	6	12.5	17.1	$ 33.75
KSC	2,361	40	2,178	92.2	127	1.7	5.9	3,513.13
LaRC	3,399	175	3,106	91.4	137	5.2	4.7	3,950.69
WFC	443	22	400	90.3	6	5.0	1.6	655.02
JSC	3,782	147	3,107	82.2	118	3.9	4.0	2,870.69
FRC	484	33	382	78.9	14	6.8	4.0	456.90
HQ.	1,555	94	1,222	78.6	124	6.0	11.0	3,175.45
MSFC	4,858	74	3,711	76.4	97	1.5	4.0	4,141.30
LeRC	3,311	59	2,429	73.4	168	1.8	7.1	4,468.75
GSFC	3,823	101	2,435	63.7	48	2.6	2.1	2,092.72
ARC	1,701	116	997	58.6	95	6.8	10.8	2,706.70
NASA-WIDE	25,757	866	20,007	77.7	940	3.4	4.9	$28,065.10
							ANNUAL DOLLAR INCREASE	$729,692.60

LUNNEY PRESENTED AWARD—Hailed for his work as Technical Director of the Apollo-Soyuz Test Project, Glynn S. Lunney (left) of the Johnson Space Center, former Apollo Spacecraft Project Manager, was presented the Arthur S. Flemming Award at a ceremony in Washington June 13. The award, sponsored by the Downtown Jaycees of Washington, is presented annually to recognize those who have performed outstanding and meritorious work for the Federal Government. Shown with him are Richard Kozak (center) of the Jaycees, master of ceremonies, and Dr. Flemming, Chairman of the U.S. Commissions on Civil Rights and Aging, in whose honor the award is named.

NICKS SEES HUGE SPACE STRIDES BY YEAR 2000

Tells Planetarium Educators Man Will Have Greater Respect for Earth

Space stations in Earth orbit fulfilling useful needs as laboratories, manufacturing facilities, and observatories in support of man on Earth.

Islands in the sky where average citizens can vacation and see the whole world in its dynamic beauty while enjoying the freedom from gravity during a long weekend.

Exciting new three-dimensional sports requiring physical skills and new, unenvisioned equipment.

Stations in Earth orbit serving as sanitariums where special medical techniques and therapies will result from weightlessness, vacuum and radiation.

Colonies on the Moon.

These are some of the projections for space that Oran W. Nicks, Deputy Director of Langley Research Center, sees as possible before the year 2000. He outlined them in an address at a banquet on the opening day of a three-day conference of planetarium educators, held at LaRC early in June.

Participating in the conference aimed at exchanging ideas and information resulting from space exploration and research were approximately 150 planetarium educators from the Middle Atlantic Planetarium Society and the Southeastern Planetarium Association, as well as NASA scientists and engineers. It was the first joint meeting of the two organizations and the first meeting of its kind held at Langley.

In discussing his projections, Nicks said that man's knowledge and technology are expanding so rapidly that such advances and achievements by the year 2000 are both plausible and feasible.

"Americans will be enjoying greater productivity, a change in life styles toward increased leisure, and a world more concerned with cultural

advances and economics than with military conflicts," he continued.

". . . The clear perspective of our Earth and its place in the universe will become a part of every inhabitant's outlook. It is this kind of perspective that is leading men to a greater respect for others who share our planet, and a better appreciation for the importance of preserving its environment and resources. The same perspective will produce an anomalous divergence: an increase in respect for the uniqueness of Earth, along with a strong urge to explore and exploit other planets in our neighborhood."

He named as another "significant" impact the importance communication satellite technology will have played in shaping world affairs.

"I believe the signs are clear that economic and cultural competitions will replace wars and that we will see within the next 30 years our global involvement become more like that among states in America," he said. "No doubt, there will continue to be disputes and conflicts, but I believe they are likely to be dealt with in other ways than with fighting."

MSFC LIBRARIAN REWARDED

The U.S. Civil Service Commission and cooperating universities have selected Miss Lois M. Robertson of Marshall Space Flight Center to receive a fellowship in education for public management at the University of Virginia.

Miss Robertson is head librarian in the Science and Technical Information Division at MSFC, a position she has held since 1960. She was nominated for the fellowship through the NASA Career Development Fellowship Program for 1974-1975.

Lois Robertson

Prior to taking over her duties at MSFC, she was a librarian with the Army Ballistic Missile Agency and Redstone Arsenal Libraries. She is a native of Huntsville, AL, and holds a BS degree in education (library sciences) from the University of Alabama in Tuscaloosa.

A grant of $21,388 for the study of bio-degradation efforts of rocket propellant chemical waste materials has been awarded Alcorn A&M University, a predominantly black college in Loran, MS, by the Marshall Space Flight Center.

THIRTY YEARS OF SERVICE—Jeanne K. Hudelson, an international relations specialist, receives a citation and congratulations from Arnold Frutkin, Assistant Administrator for International Affairs, upon completing 30 years of government service. She has been with Code I 13 years, having previously worked with the Atomic Energy Commission and as a Department of the Army civilian in Europe.

NEW ENERGY BIBLIOGRAPHY

A new publication, entitled ENERGY: A SPECIAL BIBLIOGRAPHY WITH INDEXES, has been issued by the Scientific and Technical Information Office.

Included in its pages are 1,708 references to technical reports, journal articles, conference papers, and other documents acquired by the NASA information system from January, 1958, through December, 1973.

The bibliography is divided into the following seven sections: energy policies and system studies; solar energy; other primary energy sources; secondary energy sources; energy conversion; energy transport, transmission, and distribution; and energy storage. Six indexes, similar to those in the Scientific and Technical Aerospace Report (STAR), a monthly publication issued by this office, also are included.

A continuing bibliography on the same subject, to be published quarterly, now is underway. The first issue, covering the period from January through March, 1974, will be published in August of this year and will be sent on automatic distribution to all NASA libraries.

Both the special bibliography (SP-7042) and the continuing bibliography (SP-7043) are available from the National Technical Information Service, Springfield, VA 22151, the former at $6 per copy and the latter at $4 per copy.

LOW COST CORNER

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Historically, costs for documentation have been as high as 20% of total contractor cost for design and development contracts. It has been estimated that each page of finished documentation costs $100 to $200. To reduce your costs ask yourself the following: what's the difference between a "need" and a "want", what is the purpose of the document, where is it required, could several documents be combined into one, have you made maximum use of the contractor's documents and could the document be eliminated.
FOR FURTHER INFO CALL LOW COST SYSTEMS OFFICE 202-755-8323

3 FELLOWS ASSIGNED TO NASA

Three faculty members from outstanding universities of the U.S. have been selected under the Federal Faculty Fellowship Program for duty at NASA Headquarters during the next year.

This program is designed to make the knowledge and techniques of college and university faculties available on a systematic basis to departments and agencies of the Federal Government, enabling them to enhance their capabilities in selective areas and to enrich the teaching and research capacity of those who participate.

Non-profit organizations, such as the American Assembly of Collegiate Schools of Business, National Association of Schools of Public Affairs and Administration, and Brookings Institution, operate the program in cooperation with the U.S. Civil Service Commission.

The selection process starts each fall and ends in June or July, with placements for approximately one year. Those selected are outstanding faculty members whose accomplishments indicate that they will contribute to and benefit from such a program.

The three assigned to NASA are Dr. Olof H. Lundberg, Jr., Assistant Professor at Louisiana State University; Dr. Tandy Tollerson, Professor and Chairman of the Department of Political Science at Fisk University; and Dr. Anthony Noel Doherty, Associate Professor and Chairman of the Department of Quantitative Analysis at St. John's University.

Dr. Lundberg, Jr.

Dr. Lundberg will work in the Program Support Branch of the Office of Space Science, reviewing, evaluating and recommending revisions of the Management Information and Control System. This system was formally instituted in 1965 as a jointly-sponsored Headquarters and field center project management tool. Its duties include the standardization of management, the presentation of summary levels, and the reporting of progress toward meeting established technical, financial, and scheduling commitments on OSS projects at nine of the ten NASA Centers.

Dr. Tollerson's assignment will be in the area of personnel management evaluation. He will aid in the development of a new evaluating system for NASA and will participate in the review and evaluation of Center and agency-wide personnel management programs. His primary contributions will be in the development and application of survey methodology and evaluation instruments. He also will assist in coordinating the functions and activities of on-site review teams and in synthesizing agency-wide evaluation findings.

Dr. Tandy Tollerson

Dr. Doherty will be an economic and statistical consultant in the Office of Policy Analysis, also serving in this capacity for other offices and projects. He will advise, for example, on economic matters such as the current state of the art of knowledge among economists as it relates to new technology and economic growth. He also will be involved in a variety of projects and studies on contemporary public issues with energy and with economic and earth resource implications.

Dr. A. N. Doherty

YOUTHS BOOST ANNIVERSARY

A growing national youth organization that has as one of its goals a better student understanding of the many uses of science and technology is beating the bushes in an effort to encourage each state to observe the fifth anniversary of the Moon landing.

This youth group is the Federation of Americans Supporting Science and Technology (FASST), founded at the University of Michigan in 1970 and now made up of more than 300 members in 21 chapters established in high schools and colleges. Other goals include better understanding between students and industry and government, and getting youths to plan and participate in technological programs which affect their lives.

In letters enclosing a suggested proclamation,

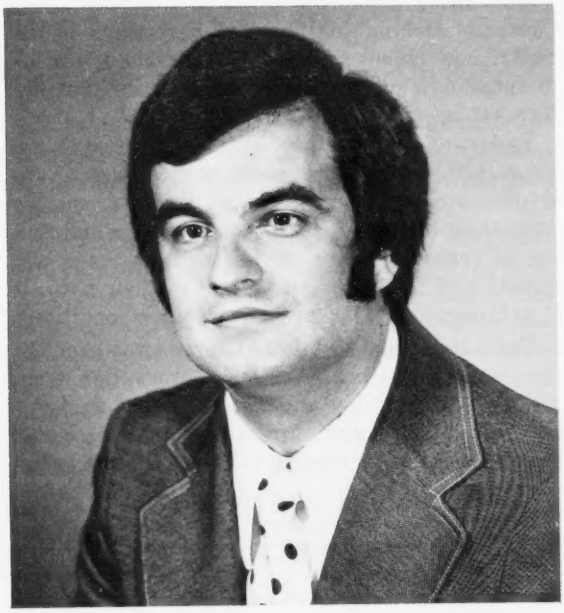
sent to Governors all over the nation, FASST is proposing that the week of July 15-22 be set aside as "Moonwalk Week" to call the attention of people to the anniversary.

A letter to its members states:

"Because there is no major space activity during the summer of 1974 and because of the many benefits gained from the space program, the FASST National Office feels that it should be a perfect opportunity to commemorate this historical event. We hope you will join with other FASST members in commemorative activities."

Its membership is asked to set up appropriate "Moonwalk Week" displays in local shopping centers, distribute "America Needs Space to Grow" bumper stickers, write letters to local newspaper editors citing benefits gained from the Moon missions, discuss on radio and television the impact of the space program, and encourage the showing of space-oriented films in theaters, on television, and before civic groups.

FASST's headquarters is at 1785 Massachusetts Avenue, Washington, DC 20036.



EDUCATION WORKER—Thomas E. Pinelli, an outstanding Virginia teacher, has completed an 18-month assignment at Langley Research Center under the Intergovernmental Personnel Program in which he was primarily responsible for developing and managing educational services in industrial arts to communities of Kentucky, North and South Carolina, Virginia and West Virginia.

MISSISSIPPI TEST FACILITY GETS NEW NAME, NEW STATUS

Facility Is Made a Permanent Field Installation, to Report Directly to Headquarters

The Mississippi Test Facility, created in 1961 as a part of the Marshall Space Flight Center, has been converted into a permanent field installation, reporting directly to NASA Headquarters, and its name has been changed to the National Space Technology Laboratories (NSTL).

In announcing the new status of the facility, Dr. James C. Fletcher, NASA Administrator, said:

"NSTL has developed into an installation where highly qualified capabilities exist for conducting remote sensing, environmental, and related research and technical activities. These capabilities have been enhanced in recent years by the location at NSTL of research and technical activities of several other government agencies. The success of this experiment in the co-location of these mutually supporting activities has led me to decide that NSTL will have a permanent role in NASA's space applications and technology programs.

"By renaming the facility and elevating its status, it is my intention to recognize the importance of NSTL to current and future programs of NASA and to encourage and facilitate the location at NSTL by other government agencies of additional activities which can both benefit from and contribute to the capabilities which exist there."

NSTL is headed by Jackson M. Balch, Manager. Its new status reflects the growing importance of its activities to current and future programs of NASA and of other agencies taking advantage of the capabilities offered on the 141,000-acre site situated at Bay St. Louis, MS.

A $350-million installation, NSTL was first used for static testing of the large rocket engines used in the Apollo program. When this program drew to a close, NASA and several other agencies moved into its modern facilities a variety of research and technical activities, primarily related to earth resources and the environment.

NASA activities at NSTL now involve those of an Earth Resources Laboratory and the developmental testing of the main engine for the Space Shuttle. Other agencies with programs underway there include the Department of Commerce, De-

partment of the Interior, Department of Transportation, Department of the Army, the U.S. Environmental Protection Agency, the State of Mississippi, and various other state and university elements from Mississippi and Louisiana.

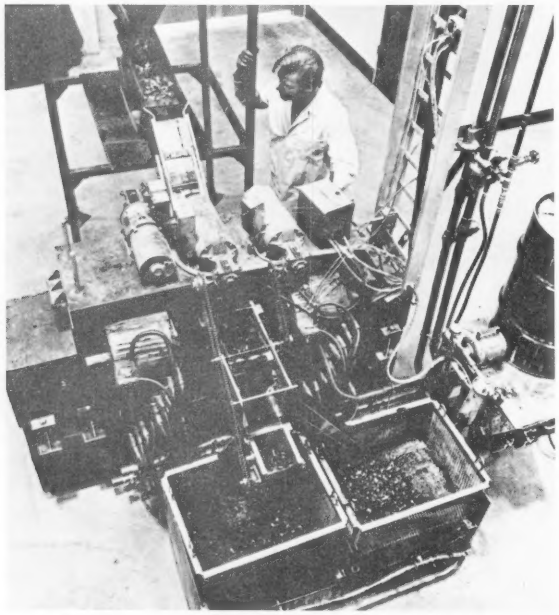
STATE AIDS GSFC DRIVERS

Through a federal-state cooperative effort, employees at the Goddard Space Flight Center who do most of the driving of that Center's government vehicles now are getting the benefit of the State of Maryland's driver training expertise.

Necessary course materials were supplied the Center by the Maryland State Motor Vehicle Administration on June 13. The course consists of six hours of classroom and road training in two-hour increments.

During the first few weeks, 120 of the so-called professional drivers will undergo the training. When they have finished, the course will be opened to those who drive government vehicles often and, finally, to all employees.

SPACELAB MODEL—Dr. William R. Lucas (left), who recently succeeded Dr. Rocco A. Petrone as Director of the Marshall Space Flight Center, explains a model of Spacelab to John F. Yardley, Associate Administrator for Manned Space Flight. Spacelab is a cooperative program between NASA and the European Space Research Organization.



RECOVERING AUTOMOBILE SCRAP—**This prototype of a ferrofluid machine, designed to separate non-ferrous metals such as zinc, copper and aluminum from automobile scrap, stems from space technology developed to study magnetically responsive ferrofluids as propellants under zero gravity conditions. It was built by Avco Systems Division, Lowell, MA, under NASA contract. Until it was developed, the separation of non-ferrous metals from scrap was too costly and time-consuming.**

EXPANDING RADAR USE

The Earth Resources Office at Kennedy Space Center is looking for peaceful new ways to use radar, now chiefly recognized for its application in automobile traffic speed control and in weather forecasting.

Radar, an outgrowth of World War II, is a radio detecting device that emits and focuses a powerful scanning beam of ultra high frequency waves, establishing through the reception and timing of reflected beams the distance, altitude and direction of motion of any object in their path. It is unhindered by darkness or weather conditions.

Tests conducted last fall at three sites near the Center indicate that electronic observation techniques have possible application in the fields of urban land use planning and in managing water resources under increasing pressure from a growing population.

13 GET SNOOPY AWARDS

Astronaut Dr. Edward G. Gibson, science pilot of the Skylab 4 mission, presented Snoopy Awards to 13 Marshall Space Flight Center employees and contractor personnel in June in recognition of their exceptional skills and quality workmanship in performing their duties on manned space flight programs.

Skylab Program Office employees receiving awards included John T. Humphreys, Hugh A. Mercer, Valmore Fogle, Delmar E. Towery, Thomas W. Ogletree, Jannie Lester, Herbert H. Wiggins and David E. Snoody. Another recipient was Harry H. Berry, Technical Services Office, Administrative and Program Support.

Contractor employees who received awards were J. R. McCoy, Hayes International Corp.; Dr. Tulio R. Figarola of the Kelsey-Seybold Clinic, who headed the Medical Center at MSFC; William S. Clark of the McDonnell Douglas Corp., and Bernard Woods of the Bendix Corp.

EXCESS PROPERTY OFFICE

Under a recently-signed interagency agreement, the General Services Administration has established a Personal Property Center at Marshall Space Flight Center. It is part of a joint GSA-NASA effort to improve, within the federal family, reuse and disposal of excess personal property.

The new office will be staffed with a manager and a property disposal clerk. They will be assisted, when necessary, by property marketing specialists, auctioneers and other personnel from the GSA Region IV office in Atlanta.

SKYLAB DATA PROCESSING

Post-splashdown processing of Skylab data now is in full swing at Marshall Space Flight Center, according to Charles Houston, Chief of the Data Reduction Branch.

Data is also being processed at the MSFC-Slidell (LA) Computer Complex.

Delivery of Scientific User Tapes and accompanying reference materials is scheduled for completion by early October. The main area of interest is information gathered by the telescopic instruments housed in the Apollo Telescope Mount section of Skylab.

AERIAL WEED SURVEY

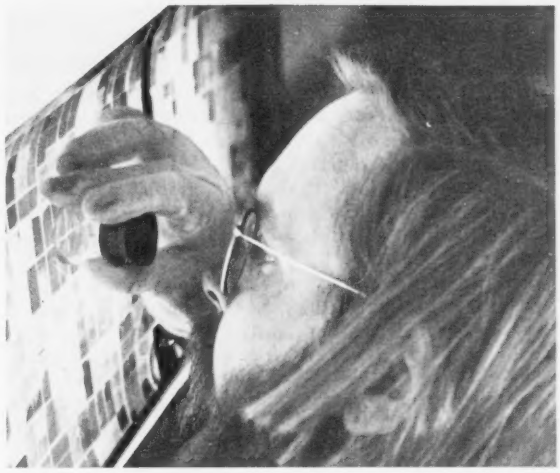
NASA has found that some weeds can be spotted better from 65,000 feet in the air than from the ground—and at much less cost.

The tipoff was the "Dydaim melon," an annual, inedible variety of cantaloupe introduced from India into the Imperial Valley of California in 1953. It grows rapidly and spreads at severe economic loss over such crops as cotton, alfalfa, sugar beet, and asparagus.

The melon infestation in crops, especially asparagus, is difficult to detect from the ground because of limited visibility in the high-growing asparagus and uncomfortable ground conditions brought on by high heat, high humidity, and prevalence of rattlesnakes. In at least one instance, an infestation was detected from an Earth Resources Aircraft flight after 100 man hours of ground survey had failed to reveal it.

Complete surveys from the ground are considered economically impossible. Random checks of the 64,000-acre Dudaim melon eradication project area would cost at least $125,000 annually, it is estimated.

Air survey costs were found to include $2,860 for aircraft flight time and $650 for film and photographic processing. On this basis, it is estimated the entire 64,000 acres could be surveyed by high-altitude photography for less than $10,000.



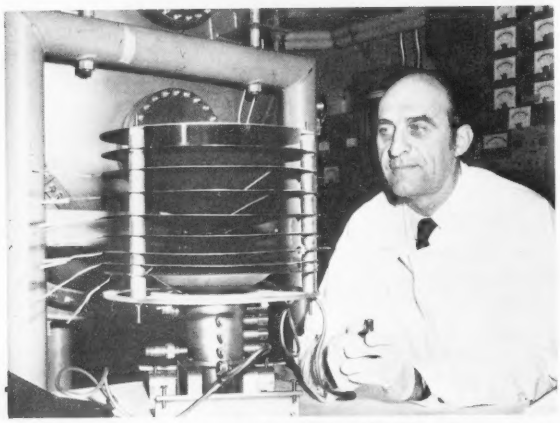
AID TO FARMERS—Robert Ekstrand, Operations Supervisor at the NASA Data Facility at Ames Research Center, studies 9x8-inch transparencies of the Imperial Valley to help farmers identify infestations of Dudaim melons threatening their crops.

FACULTY FELLOWSHIP PROGRAMS

Forty-one educators from 39 colleges and universities are participating in Marshall Space Flight Center's annual Summer Faculty Fellowship Programs.

Conducted by Auburn (AL) University, included are the Engineering Design Program and the Aeronautical and Space Research Program. They are sponsored by NASA and the American Society for Engineering Education.

In the Space Research Program, each faculty member works with a MSFC colleague and is associated directly with the aeronautics and space program in a research project of mutual interest. The visiting educators undertake in the Engineering Design Program an assessment and study of power sources and distribution systems relative to the current energy crisis.



RADIO AND TV SIGNAL AMPLIFIER—Shown here in a half-size version is a high-efficiency power device called the Depressed Collector Tube, to be tested on a Communications Technology Satellite scheduled for launch next year. The project, a joint U.S.-Canadian undertaking, is designed to advance technology for broadcast distribution from space to remote areas, particularly in northern Canada and Alaska.

The collector, consisting of concave plates, retrieves excess energy passing through the tube and cycles it back to the power supply, saving substantial amounts of energy and increasing working efficiency by 50 per cent or more.

Shown with the tube is Dr. Henry G. Kosmahl of Lewis Research Center, who, with the aid of his colleagues, developed the super-efficient device during the last three years.

SSM PROPOSALS ASKED

Marshall Space Flight Center has requested from industry proposals on conducting the definition and preliminary design work on the Support Systems Module (SSM), a major component of the Large Space Telescope.

Two parallel contracts of 15 months duration for early design of the SSM will be awarded following an evaluation of the proposals.

The SSM will be attached to the structure housing the telescope and will provide electrical power, data storage, communications, environmental control, and coarse attitude sensing and control. In addition, the unit will contain some of the elements needed for orbital servicing and retrieval of the telescope by the Space Shuttle.

HARNESSING WIND ENERGY—This artist's concept is of a 100-kilowatt windmill, a forerunner of much larger systems which could supply between 5 and 10 per cent of the country's total electric power needs by the year 2000. It will be built and tested by Lewis Research Center. The tower will be 125 feet tall, with rotor blades spanning 125 feet tip to tip. The horizontal cylinder at the top will contain the power transmission and controls system.

GLOBAL WEATHER STUDY

NASA's high altitude jet research aircraft, Galileo II, has joined an intensive international effort to understand the tropical atmosphere and its effect on global weather patterns.

The four-engine jet transport, extensively modified to carry a variety of scientific payloads, left Ames Research Center on June 17 for Dakar, Senegal, Africa, the westernmost point of that continent, where the headquarters for the effort has been established.

Galileo 12 and 12 other aircraft, together with 38 ships, 60 ocean buoys, six types of satellites and nearly a thousand land stations, will gather data on weather and ocean phenomena from the top of the atmosphere to about 5,000 feet below the sea surface.

The area under investigation includes some 20 million square miles in a broad swath of the tropics extending from the eastern Pacific Ocean across Latin America, the Atlantic Ocean, Africa, and to the western Indian Ocean. The data-gathering portion of the study will last from mid-June through Sept. 23.

FILM ACTIVITY

The NASA film "APOLLO 17—ON THE SHOULDERS OF GIANTS" was awarded the Trophy of the Italian Department of Defense at the First International Review of Cinima and TV Films on Flight held in Milan, Italy, recently. Twelve nations participated, with 93 productions in competition.

Marshall Space Flight Center has issued a request for proposals on a study to investigate hydrogen as a possible general energy source.

LUNAR SAMPLE EXHIBITS

The following is a schedule of lunar sample exhibits from July 15 to August 15:

CALIFORNIA—Orange County Fair Association, Fair Drive, Costa Mesa, July 12-21.

FLORIDA—Moonwalk Exhibit, Merritt Island, July 15-20.

INDIANA—Cass County 4-H Fair, Agricultural Building, Cass County 4-H Fair Grounds, Logansport, Aug. 4-9.

MICHIGAN—Eaton County 4-H Fair, Commercial Building, 126 N. Bostwick Avenue, Charlotte, July 22-27.

OHIO—Armstrong Air and Space Museum Anniversary, Wapakoneta, July 8-Aug. 12.

TEXAS—Houston Museum of Natural Science/History, End of Caroline at Herman Park, Houston, July 15-Aug. 15.

VIRGINIA—1974 Gem and Mineral Show, Virginia Beach Civic Center (Dome), 19th and Pacific Avenue, Aug. 9-11.

WASHINGTON—Expo '74, Federal Pavilion, World's Fair, Spokane, July 1-Aug. 9.

CANADA—Provincial Museum of Alberta, 12845-102 Avenue, Edmonton, Alberta, July 14-Aug. 4; First Canadian World Conference on Aerospace and the Community of Man, Vancouver Hotel, Vancouver, B. C., Aug. 5-8; Abbotsford International Airshow, Abbotsword Airport, B. C., Aug. 9-11.

Permanent Displays

ALABAMA—Alabama Space & Rocket Center, Marshall Space Flight Center, Huntsville.

FLORIDA—Visitor Information Center, Kennedy Space Center.

KANSAS—Eisenhower Library, 200 S.E. 4th Street, Abilene.

NEW YORK—United Nations Building, New York City.

OHIO—U.S.A.F. Museum, Wright Patterson Air Force Base.

TEXAS—Johnson Library, University of Texas, Austin; Visitor Information Center, Johnson Space Center, Houston.

VIRGINIA—Visitor Information Center, Langley Research Center, Hampton.

WASHINGTON, DC—National Geographic Museum; Smithsonian Institution, National Air and Space Museum, 1000 Jefferson Drive.

RADIO-TELEVISION (Released Nationally)

July

TELEVISION—A special Apollo 11 fifth anniversary release: "Apollo 11 . . . A Journey Recalled," (6½-minute color film). Also releasing a color 4½-minute film in the *Aeronautics and Space Report* series: "Quadriplegic Helps Self with Space Device."

RADIO—Four weekly *Space Story* programs concerning the fifth anniversary of Apollo 11 have been released. Featured are: Dr. Rocco A. Petrone, NASA Associate Administrator; Dr. Christopher C. Kraft, Director, Johnson Space Center; Dr. George M. Low, NASA Deputy Administrator; and Dr. Glynn S. Lunney, Apollo-Soyuz Technical Director. Two *NASA Special Reports* have been released: "Eagle on the Moon: Apollo 11 Revisited" and "Apollo 11 in Perspective," featuring comments by Dr. Low.

Nine *Audio News Feature* interviews concerning the Apollo 11 fifth anniversary also have been released. Interviewees are: Dr. Wernher von Braun, former NASA Deputy Associate Administrator; Eugene Kranz, Apollo 11 Flight Director; Walter Kapryan, Launch Operations Director; Dr. Ernst Stuhlinger, Associate Director, MSFC; Archibald MacLeish, poet; Dr. William R. Lucas, Director, MSFC; Clifford Charlesworth, Lead Apollo 11 Flight Director; Dr. Kurt H. Debus, Director, KSC; and Dr. Arthur D. Schlesinger, Jr., historian.

HEADQUARTERS PRESS RELEASES

(Issued by the Public Information Division, Code FP, Headquarters, Washington, DC 20546. These releases are available only to members of the news media.)

74–148 Dr. Whitcomb to Receive $25,000 Award from NASA
74–149 NASA Aircraft Photos Locate Weeds
74–150 Wallops Center Plans June Rocket Series
74–151 Space Applications Fact Sheet
74–152 NASA, DOT Reshape Trucks in Test to Save Fuel
74–153 NASA Plane in International Weather Study
74–154 New Weather Satellite on Station
74–155 Scientific Investigators Named for 1978 Venus Probe
74–156 Lead-Melting Heat Produced in Space Simulator
74–157 NASA Marks 5th Anniversary of 1st Lunar Landing
74–158 Benedict College Awarded NASA Grant
74–159 NASA Mississippi Test Facility Acquires New Status
74–160 747 Selected for Space Shuttle Orbiter Ferry Flight
74–161 Down to Earth Space Benefits Result from Moon Missions
74–162 NASA Chooses Sunlit Side for Second Mercury Encounter
74–163 Jet Airliner Test Air Traffic Equipment
74–164 Correction (Note to Editors) to 74–163
74–165 Spanish-Speaking Program Coordinator
74–166 Note to Editors (Anniversary Materials)
74–167 NASA Patent Licensing Conference Scheduled
74–168 International Team Studies Possible Jupiter Flight
74–169 Note to Editors: Skylab Results Meeting
74–170 Dr. King Named to Head Environmental Effects Office
74–171 NASA Holography Survey Published
74–172 Satellite Ready to Begin Educational Transmission

INVENTIONS AND CONTRIBUTIONS BOARD MONETARY AWARDS

(The Inventions and Contributions Board, at its meetings of January 29, February 21 and March 28, 1974, recommended that monetary awards be granted to the NASA employees and the NASA contractor employees identified on the following list for scientific and technical contributions to space and aeronautical activities. The recommendations were approved by the Administrator and the awards have been made.)

Innovator(s)	*Title of Invention or Contribution*
AMES RESEARCH CENTER	
Robert D. Lee	Ultrasonic Biomedical Measuring and Recording Apparatus
Kenneth L. Orloff Williamb D. Gunter, Jr. George R. Grant	Dual Wavelength Scanning Doppler Velocimeter
BENDIX CORPORATION	
Richard C. Taylor	Multi Axes Vibration Fixtures
BOEING COMPANY	
Robert D. Dubois George T. Pinson	A Guide for a Typewriter
CALIFORNIA INSTITUTE OF TECHNOLOGY	
Dr. Charles G. Miller	Purging Means and Method for Xenon Arc Lamps
Robert E. Frazer	Nonmetallic Nonmagnetic RF Barrier and Low Reflectance Materials
GODDARD SPACE FLIGHT CENTER	
Otto E. Berg	Cosmic Dust Sensor
Aaron Fisher Carroll H. Clatterbuck	Microscope Multi-Angle Reflection, Viewing Adapter and Photograph Recording System
JET PROPULSION LABORATORY	
Dr. Alan Rembaum Mrs. Shiao-Ping Siao Yen	Novel Polyelectrolytes
Mahlon F. Easterling	Two Carrier Communication System with Single Transmitters
Arthur C. Ludwig Richard T. Woo	Low Loss Dichroic Plates
Marvin K. Simon William C. Lindsey, Jr.	Coherent Receiver Employing Nonlinear Coherence Detection for Carrier Tracking
Robert B. Nakich Raymond C. Woodbury	Apparatus for Scanning the Surface of a Cylindrical Body
JOHNSON SPACE CENTER	
Jeri W. Brown	Reduced Gravity Fecal Collector Seat and Urinal
LANGLEY RESEARCH CENTER	
Bruce Flagge	Measuring Probe Position Recorder
John B. Hall, Jr. Edwin F. Williams	An Automatic Liquid Inventory Collecting and Dispensing System
Judd R. Wilkins Stacey M. Mills	Apparatus for Microbiological Sampling
Richard T. Whitcomb	Airfoil Shape for Flight at Subsonic Speeds
LEWIS RESEARCH CENTER	
George A. Repas	Rocket Propellant Injector
Lawrence P. Ludwig William F. Hady	High-Speed Self-Acting Shaft Seal
MARSHALL SPACE FLIGHT CENTER	
Jimmie H. Holden	Fixtures for Handling Panel Articles
Clifton R. Sims	Multi Axes Vibration Fixtures
James M. Hoop	Ultrasonic Bone Densitometer

INVENTIONS AND CONTRIBUTIONS BOARD MONETARY AWARDS—Cont.

McDONNELL DOUGLAS AIRCRAFT CORPORATION

Dale E. Havens
George V. Buhler — A Meter for Use in Detecting Tension in Straps

PATENTS AND INVENTIONS RESULTING FROM NASA RESEARCH

(The Office of General Counsel, NASA Headquarters, announces that the following U.S. patents have been issued by the U.S. Patent Office to NASA for inventions resulting from NASA research. Inquiries concerning them should be directed to the attention of the NASA Patent Counsel for the indicated installation.)

Inventor(s) and Employer	*Title and NASA Docket*	*Patent No.*	*Installation*
William V. Johnston, North American Rockwell Corp., Canoga Park, CA	Heat Flow Calorimeter (GSC–11,434–1)	3,813,937	GSFC
Wilbur C. Heier, NASA/LaRC	Lamination Method and Apparatus (XLA–11,028–1)	3,814,653	LaRC
Beverly W. Lewis, NASA/LaRC; and Charles S. Stokes, Edward W. Smith and William J. Murphy, Research Institute of Temple Univ., Philadelphia, PA	Barium Released System (LAR–10,670–2)	3,813,875	LaRC
Louis R. McCreight, General Electric Co., Philadelphia, PA	Electrophoretic Sample Insertion (MFS–21,395–1)	3,814,678	MSFC
Donald P. Golden, George W. Hoffler and Roger A. Wolthuis, Technology, Inc., Houston, TX	Apparatus and Method for Processing Korotov Sounds (MSC–13,999–1)	3,814,083	JSC
Phillip M. Hopkins and Wally M. Wallington, Lockheed Electronics Co., Houston, TX	Differential Phase-Shift-Keyed Communication System (MSC–14,065–1)	3,816,657	JSC
Dallas G. Wetzier, McDonnell Douglas Corp., Huntington Beach, CA	Thrust-Isolating Mounting (MFS–21,680–1, MFS–21,681–1)	3,814,350	MSFC
John F. Hamlet, NASA/MSFC	Stable Supply Oscillator (MFS–21,698–1)	3,815,048	MSFC
Paul W. Clemons, Sperry Rand Corp., Huntsville, AL	Device for Configuring Multiple Leads (MFS–22,133–1)	3,815,205	MSFC
James J. Cowan, National Academy of Sciences, Washington, DC	Holography Utilizing Surface Plasmon Resonances (MFS–22,040–1)	3,815,969	MSFC
Charles W. Whitehead, NASA/LaRC	Apparatus for Inserting and Removing Specimens from High Temperature Vacuum Furnaces (LAR–10,841–1)	3,817,084	LaRC
James M. Donohue and Benjamin G. Zimmerman, NASA/GSFC	Passive Dual-Spin Misalignment Compensators (GSC–11,479–1)	3,818,767	GSFC
Jack D. Loose, NASA/MSFC	Steady State Thermal Radiometers (MFS–21,108–1)	3,819,419	MSFC
Leonard L. Gelb, William B. Helbert, Jr., and Ronald B. Ernie, Hercules, Inc., Wilmington, DE, and Richard F. Mulliken, NASA/LaRC	Method of Repairing Discontinuity in Fiberglass Structures (LAR–10,416–1)	3,814,645	LaRC
Henry D. Obler and Hugh B. Bauer, NASA/GSFC	Air Conditioning System and Component Therefor Distributing Air Flow from Opposite Directions (GSC–11,445–1)	3,818,814	GSFC
Charles F. Burch, NASA/LaRC	Grinding Arrangement for Ball Nose Milling Cutters (LAR–10,450–1)	3,820,286	LaRC
Joe F. Melugin and David E. O'Brien, III, NASA/JSC	Technique for Recovery of Voice Data from Heat Damaged Magnetic Tape (MSC–14,219–1)	3,819,440	JSC
Larry P. Ratcliff, NASA/JSC	Latch Mechanism (MSC–12,549–1)	3,820,741	JSC
Philip M. Hopkins and Wally M. Wallingford, Lockheed Electronics Co., Houston, TX	Differential Phase-Shift-Keyed Signal Receiver (MSC–14,066–1)	3,818,346	JSC

PATENTS AND INVENTIONS RESULTING FROM NASA RESEARCH—Cont.

Carle Brawner and Larry McDavid, Beckman Instruments, Inc., Fullerton, CA	Specific Wavelength Cororimeter (MSC–14,081–1)	3,817,627	JSC
William A. Boshers, NASA/MSFC	Battery Testing Device (MFS–20,761–1)	3,818,325	MSFC
Peter Price, Olgerts Veikins, Edward R. Bate, Jr., and Robert H. Jones, Inca Engineering Corp., San Gabriel, CA	Apparatus for Establishing Flow of Fluid Mass Having a Known Velocity (MFS–21,424–1)	3,817,082	MSFC
Richard B. Hoover, NASA/MSFC	Three Mirror Glancing Incidence System for X-ray Telescope (MFS–21,372–1)	3,821,556	MSFC
Walter T. Appleberry, McDonnell Douglas Corp., Huntington Beach, CA	A Device for Measuring Tensile Forces (MFS–21,728–1)	3,820,388	MSFC
Raymond L. Gause and C. G. Glenn, NASA/MSFC	Conductive Elastomeric Extensometer (MFS–21,049–1)	3,820,529	MSFC
Richard N. Griffin and Louis R. McCreight, General Electric Co., Philadelphia, PA	Conducting Flow Electrophoresis in the Substantial Absence of Gravity (MFS–21,394–1)	3,821,102	MSFC
John B. Carraway, Caltech/JPL, Pasadena, CA	Miniature Multichannel Biotelemeter System (NPO–13,-065–1)	3,815,109	NaPO
John A. Parker and Alvin H. Heimbuch, NASA/ARC	Chromato-Fluorographic Drug Detector (ARC–10,633–1)	3,814,939	ARC
Charles G. Miller, Caltech/JPL, Pasadena, CA	Improved Dispensing Targets for Ion Beam Particle Generators (NPO–13,112–1)	3,816,785	NaPO
Salvatore R. Riccitiello and John A. Parker, NASA/ARC	Intumescent Composition Foamed Product Prepared Therewith and Process for Makins Same (ARC–10,-304–2)	3,819,550	ARC
Robert J. Zeiger and John C. Gerdts, NASA/ARC	Concentric Differential Gearing Arrangement (ARC–10,462–1)	3,818,775	ARC
Ronald J. Wojtasinski and Donald D. Lovall, NASA/KSC	Electric Field Measuring and Display System (KSC–10,731–1)	3,820,095	KSC

1974 LAUNCH SCHEDULE

Name	*Launch Date*	*Vehicle*	*Range*	*Mission/Remarks*	
Skynet II–A (UK)	Jan. 18 ..	Delta	ETR	Reimbursable launch. United Kingdom's communications satellite.	Launched Vehicle failure
Centaur Proof Flight	Feb. 11 ..	Titan III–E Centaur ..	ETR	Test flight of booster planned for Viking Mars launch in 1975.	Launched Engine failure
San Marco (SM–C2)	Feb. 18 ..	Scout	SM	United States/Italy cooperative mission to conduct air density measurements.	Launched
UK X–4	Mar. 8	Scout	WTR	Reimbursable launch. United Kingdom technology satellite with experiments related to spacecraft power systems, attitude control and stabilization.	Launched Successful
WESTAR–A	April 13..	Delta	ETR	Western Union communications satellite. Reimbursable launch.	Launched
SMS–A	May 17 ..	Delta	ETR	First prototype/developmental mission for geostationary meteorological operational satellite system; day and night continuous imaging of cloud cover; sophisticated remote-platform data-collection-and-weather data relay.	Launched
ATS–6	May 30 ..	Titan III–C	ETR	Developmental and demonstrative communications mission using technology applicable to terrestrial and space needs; utilizes 9.15-meter (30-foot) deployable parabolic antenna and communications system with frequencies in several bands; will support public communications experiments in the U.S. and India.	Launched

1974 LAUNCH SCHEDULE—Cont.

Name	*Launch Date*	*Vehicle*	*Range*	*Mission/Remarks*	
Hawkeye (formerly Injun-F)	June 3 ..	Scout	WTR	To study the topology of the magnetic field at large radial distance over the Earth's dgear caps and the interaction of the solar winds with the geomagnetic field.	Launched
WESTAR–B	July	Delta	ETR	Western Union communications satellite. Reimbursable launch.	
ITOS–G	July	Delta	WTR	Polar-orbiting operational meteorological satellite funded by NOAA; day and night cloud cover and temperature sounding.	
Intelsat IV F–8 ..	July	A–Centaur ..	ETR	One of a series of communications satellites to form part of a global communication commercial satellite system. Launch for COMSAT.	
AEROS–B (German)	July	Scout	WTR	Spin-stabilized, Earth-orbiting satellite designed for upper atmosphere measurements.	
Netherlands Sat.–A (ANS–A)	August ..	Scout	WTR	Designed to obtain data from celestial X-ray and ultraviolet sources.	
UK–5	August ..	.....	.....	To investigate galactic and extra galactic X-ray sources.	
Helios–A	2nd Half	Titan III	ETR	To investigate the properties of and processes in interplanetary space in the direction of and close to the Sun by developing, launching and operating automated spacecraft.	
Skynet II–B (UK)	3rd Qtr. ..	Delta	ETR	Reimbursable launch. United Kingdom communications satellite.	
WESTAR–C	October ..	Delta	ETR	Western Union communications satellite. Reimbursable launch.	
Nimbus F	October	Delta	WTR	Meteorological research and development mission to test instruments for expanding atmospheric remote sensing to cloud regions, extend observations to new spectral regions, extend sounding capabilities to higher altitudes, demonstrate feasibility for improvements to operational systems, and support GATE.	
GEOS–C	December	Delta	WTR	Geodynamic Experimental Ocean Satellite to demonstrate feasibility of satellite-altimeter techniques for measuring the topography of the ocean surface; can be significant contribution to understanding of ocean dynamics.	
Comsat–A	4th Qtr. ..	Delta	ETR	First of two maritime communications satellites to be situated over Atlantic and Pacific Oceans.	
Symphonie–A (French/German)	4th Qtr. ..	Delta	ETR	Experimental communications satellite. Reimbursable.	
Intelsat IV F–1 ..	(Under Study)	.....	.....	One of a series of communications satellites to form part of a global communication commercial satellite system. Launch for COMSAT.	
Intelsat IV F–6 ..	(Under Study)	.....	.....	One of a series of communications satellites to form part of a global communications commercial satellite system. Launch for COMSAT.	
SMS–B	(Under Study)	Delta	ETR	Second prototype/developmental mission for geostationary meteorological operational satellite system; same as SMS–A; SMS–A and SMS–B will support GARP Atlantic Tropical Experiment (GATE).	
GOES–A (SMS–C)	(Under Study)	Delta	ETR	First Geostationary Operational Environmental Satellite, follow-on to SMS missions, funded by NOAA.	

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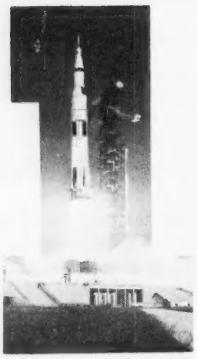

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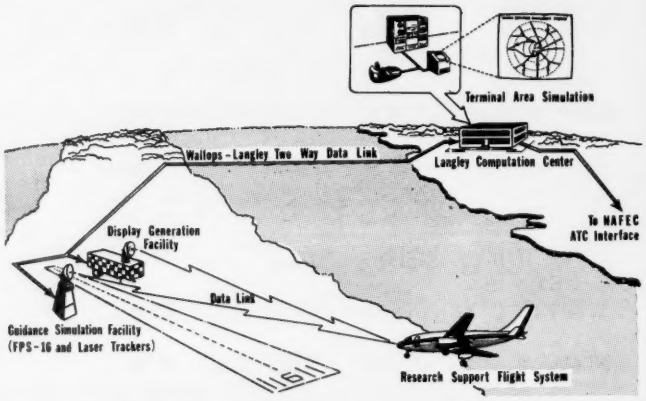

A specially-equipped Boeing 737 research aircraft, shown at left, has started on a program at Langley Research Center aimed at improving aircraft operations in the vicinity of airports, including approach and landing safety.

The project, to last through the 1980s, is known as NASA's Terminal Configured Vehicle Program (TCV). Discussing it, Gen. Bruce K. Holloway, Acting Associate Administrator for Aeronautics and Space Technology, said: "It supports a joint government effort to identify, study, and solve national airspace system problems such as aircraft noise, airway and airport congestion, safety during low visibility operations, and more efficient operations. Noise and congestion, in particular, have become acute problems at several major U.S. airports."

The program is concerned with developing technology for air operations that will efficiently use new ground equipment and advanced air traffic control procedures and concepts developed by the Department of Transportation and the Federal Aviation Administration.

Purchased by NASA from the Boeing Commercial Airplane Co. of Seattle, the 737 has been developed into a flying laboratory with advanced digital electronics equipment. Experiments to be conducted with it will place particular emphasis on human factor aspects of operations and on the interaction of crew members.

One of the major modifications involved installation of a second cockpit, located about 20 feet behind the main cockpit, and an integrated avionics system. The second flight deck, connected with the normal flight systems, provides a highly flexible method of evaluating and demonstrating advanced concepts in electronic displays, flight controls, automatic guidance, and terminal operation technology in an actual operational environment. Completely automated approaches and landings can be made by a crew flying from the aft deck, although a second crew will always be stationed in the regular flight deck for safety purposes.

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